

Uses and Potentials of Wikis in the Classroom

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As Prensky ([2001](#)) observes, "Our students have changed radically. Today's students are no longer the people our educational system was designed to teach" (1). Prensky sees today's students as digital natives while most of today's teachers remain digital immigrants. In particular, today's educators are acculturated to a print paradigm while students are increasingly products of a digitally-based secondary-oral paradigm. Happily for educators, electronic and cyber technologies can potentially combine the best aspects of both print and secondary-oral paradigms, allowing educators to move freely across the print-oral continuum. One cyber technology enabling this movement is the wiki, a unique interface where information is not fixed (as in a print model) but fluid and flexible to meet the needs of the community (as in the pre-literate age). In this article we describe how teaching and learning have changed across oral, print, and secondary-oral paradigms; in turn, after addressing some controversies over the use of wikis as scholarly and educational resources, we advocate the use of wikis as a teaching and learning tool.

Technology and Learning Paradigms

As technologies have changed through the millennia, so have teaching methods. From the one-to-one oral teaching style of the early agrarian age (pre-writing and pre-printing cultures) to the apprenticeship system and one-to-many lectures of the pre-industrial ages (writing and print cultures), teaching was predominantly oral. Oral cultures had many strengths, including an empathetic focus, grounding in the observable and immediate world, and communal ownership of knowledge. The development of printing, however, set the stage for a literacy-based model of teaching that was spread by the Industrial Revolution. This literate model also has strengths, emphasizing the preservation of knowledge and promoting abstract and analytical thought. Although the print model continues to predominate education, it is being impacted increasingly by the advent of electronic and cyber technologies that introduce a [secondary orality](#) (Ong 1982). The strengths of a secondary-oral model include a return to a strong sense of group identity and a related sense of community as well as a focus on the present.

Although the impact of electronic and cyber technologies on teaching has been studied by many scholars from McLuhan (1962) to Papert (1994, [1999](#); Papert and Friere [1980](#)), few scholars have noted a change in the dominant print-based teaching paradigm. This slow rate of impact on teaching is interesting given the unprecedented and dramatic impact of these technologies on society and industry. Although educators widely recognize that learning is improved by a mix of teaching methods, such as supplementing the traditional lecture with effective oral discussion and participation, such supplementation does little to challenge the centrality of the print model. That is, instructors continue to equate authority and ownership of knowledge with the teacher who controls the text, whether print or electronic, rather than with the learners.

An alternative model of education that may be better suited to the cyber age would take advantage of secondary orality, which relies on the affordances of print culture but also reintroduces the value of such oral characteristics as communality, group-sense, and participation (Ong 1982). Additionally, secondary orality promotes self-awareness, magnanimity, responsibility, reasonability, and the development of a "world-cultural consciousness" (Gronbeck, Farrell, and Soukup 1991). Secondary orality is uniquely a product of the twentieth century, in which advancements in electronic technology created the conditions for a resurgence and reshaping of the oral characteristics of pre- or low-literate cultures. In a secondary-oral model, learners assume ownership of knowledge within learning experiences that encourage them to engage with texts electronically.

Cyber Technologies Across Learning Paradigms

Computer media combine almost all aspects of oral and literary cultures (Wallace [2005](#)). Electronic and cyber technologies offer the potential to combine the best aspects of both print and secondary-oral paradigms, allowing educators to move freely across the print-oral continuum. Like print-based instruction, networked computer media can provide a way for students to learn material individually (and is therefore relatively inexpensive, in terms of one-on-one teacher contact hours [McClintock [1992](#)]), but like oral-based instruction, networked computer media can also provide a way for students to learn material collaboratively and take ownership of the material they are learning in a manner similar to a Socratic in-class discussion. Computers and cyber media offer many tools and technologies for teaching and learning—from the ubiquitous courseware management systems and teleconferencing systems to newer technologies like blogs, wikis, podcasting, RSS feeds, MOOs, MUDs, and simulations. In turn, the incorporation of the [erfurtWiki](#) wiki system in both the [Moodle](#) and [ATutor](#) learning management systems reflects the continuing evolution and convergence of these discrete technologies, particularly in the open source community. Any and all of these technologies can be used to provide the combined benefits of oral and print models of teaching and learning.

Wikis: Definitions and Debates

Our focus in this article is on wikis in the context of an oral-literate paradigm. The many potential uses of wikis in education have been articulated by several scholars and practitioners (Collaborative Software Lab [2000](#); Lamb [2004](#), 2005; Technologies de Formation et Apprentissage [TECFA] [2005](#); Mejias [2006](#)), but the pedagogical potentials of using this technology deserve further exploration. In this article, we consider the uses of wikis in the classroom from the perspective of praxis. While we build on the extensive work of Brian Lamb and the Georgia Institute of Technology's Collaborative Software Lab, we place the uses and potentials of wikis along a continuum on which the traditional print-based educational paradigm anchors one end and the secondary-oral paradigm the other. We hope that this orality-print continuum will provide educators, particularly K-12 and college educators of "digital natives," with a context for pedagogically effective ways to use this technology.

Since most educators are familiar with wikis, we offer only the briefest definition here (interested readers, however, can find more extensive definitions at [Community Wiki](#) or [Meatball Wiki](#)): wikis are collaborative Web-based sites with "open editing." That is, the information on a wiki can be edited by any and all users. Once users visit wikis, they can read and, if they wish, edit or change the text by using a Web-browser to re-write, re-organize, or update the structure and content of the site. In wikis, readers are writers, and readers and writers jointly form a community of collaboration. Wikis can best be seen in action through the very popular [Wikipedia](#) and [Wiktionary](#). The flow of information through wikis that makes them such a valuable tool across print and secondary-oral paradigms is effectively traced in IBM's History Flow site, which "visualizes the evolution of pages" by readers/users in Wikipedia ([2003](#), ¶ 4).

Because the technology of wikis is so simple and user-friendly, wikis have immense potential in the classroom. However, educators' grounding in the print model leads many instructors—and even digital natives—to distrust the concept of wikis profoundly. For example, digital native Jason Scott severely critiques wikis in his blog, arguing that "a low barrier to entry leads to crap By making it really, really easy to change, fundamentally, the nature of a project, you run the risk of the project becoming a battleground. A really, really crappy battleground" ([2004](#)). Ease of access is just one objection to wikis; another common objection is to wikis' unmonitored open environment, which may lead educators to reject this technology out-of-hand. [Exhibit 1](#) is a reproduction of Ken Friedman's e-mail to [Pace University's](#) Management Education and Development Discussion [listserv](#) (December 4, 2005) and illustrates the prevailing sentiment against Wikipedia as a reliable resource for students to use.

These concerns have become particularly prominent in the case of Wikipedia. As it exists today, Wikipedia is the largest wiki in existence and "the biggest encyclopedia in the history of the world . . . receiving 2.5 billion page views a month, and offering at least 1,000 articles in 82 languages. The number of articles, already

close to two million, is growing by 7 percent a month" (Seelye [2005](#), ¶ 10-11). Wikipedia's credibility, however, has come under attack because of a controversy over a falsified posting that libeled a prominent journalist (Seigenthaler [2005](#)). Since the emergence of that controversy, the issue of whether Wikipedia is a trustworthy source has been the focus of respected media, from the BBC (Thompson [2005](#)) to the *New York Times* (Johnson [2006](#)) and the journal *Nature* (Giles [2005](#))—all of which have weighed in with differing perspectives on the soundness of the information presented on Wikipedia. For us, *Nature's* study has provided the best answer, finding that Wikipedia is as accurate as the *Encyclopedia Britannica* and thus has value for education and for knowledge-seekers.

From the perspective of praxis, that value hinges on Wikipedia's and other wikis' use of a secondary-oral model that "encourages participation and a strong sense of common purpose" in student learning (Lamb [2004](#), "TheStandardObjection," ¶ 3). But communicating these ideals to students is not enough; Heather James ([2004](#)), another digital native, argues that we must allow students complete control of the content in order for a wiki to work effectively as a teaching and learning tool. Maintaining the control that was appropriate to the 19th and 20th century models of education can only lead to what James calls a "brilliant failure" in the 21st century (¶ 7). Every new technology goes through growing pains, and many new technologies undergo serious criticism in their early stages. In our opinion, the controversies over Wikipedia's trustworthiness represent these early stages, and the value of Wikipedia and other wikis will become more evident as they develop.

The question of the accuracy or truthfulness of information is certainly not a new one for students; however, new technologies make it exponentially easier for anyone to publish inaccurate or untruthful information (as seen in the libel posted in Wikipedia mentioned above). In the past, schools were able to protect students from disinformation by vetting what was on the library shelves or using carefully edited textbooks, for example, and educators may feel most comfortable with this model. Unfortunately, it may no longer be an appropriate model as new technologies continue to make it cheaper and easier for anyone, regardless of expertise or authority, to disperse information that students may encounter. The question then becomes one of educators either continuing to try to steer their students clear of any untrustworthy information or, instead, recognizing the imperative for a new paradigm—one that focuses on helping students gain information literacy skills which would allow them to differentiate and make their own judgements regarding the accuracy of information. If we accept Plato's definition that knowledge is justifiable, believed truth, then our students, in order to be effective 21st century citizens, will have to be able to ask themselves if they believe in the truthfulness of a particular piece of information, and if they can justify that belief beyond simply saying "because the teacher said so." To simply advise students to ignore any readily editable or unrefereed source, such as a wiki, runs the risk that they will not access information that may be of value to them, as more and more of this information is moved into wikis. Furthermore, it runs the risk of sending the message to the student that anything that might be easily published is not to be trusted, including anything published by the student.

Teaching and Learning with Wikis: Building on the Strengths of the Print Paradigm

The print model remains influential in teaching; educators can build on the strengths of this proven paradigm by considering advantages of moving traditional written/paper text to a cyber technology. As Culligan puts it, "The challenge facing educators and trainers is to identify learning strategies that are appropriate for Digital Natives, recognizing the different ways they process information and developing learning tools that maximize the potential of their unique cognitive approach" ([2006](#), ¶ 6).

Several uses of wikis allow teachers and learners to maximize the potential of print for digital natives by utilizing print in its electronic or digital form. For instance, wikis can be used for collaborative activities such as Web-writing or problem-solving, for information sources or case libraries, for submission of student assignments, and for project spaces. These uses draw on the traditional print paradigm with variations provided by a technology that remains "on the leading edge of the technology wave" (Culligan 2006, ¶ 2).

Wikis by their nature lend themselves to collaborative work by teachers and students. Collaborative writing, or the use of wikis to support writing instruction, is perhaps the most common use of wikis (Collaborative Software Lab [2000](#); Lamb [2004](#), [2005](#)). Using wikis in this manner has several advantages over traditional writing support, especially in allowing students to trace their instructor's and peers' comments and feedback. Students appreciate the opportunity to work collaboratively across the boundaries of time and place while concurrently benefiting from wikis' print-based features such as built-in backlinks and records of changes (for example, [Community Wiki](#)'s simple event tracking and data tracking features). Similarly, instructors can use wikis as a space for review, study, and ongoing discussion. These uses of wikis build on the print paradigm but also allow for the incorporation of features of the secondary-oral paradigm by promoting collaborative work and community mindedness.

Another common collaborative use of wikis is for problem-solving in small or large groups (Collaborative Software Lab 2000). In this regard wikis may be compared to what are known as Group Decision Systems software (GDSS), which support similar activities (Ferris [1997](#)). However, because wikis can be used much more easily and intuitively than most GDSS, wikis are ideal for group functions ranging from the simple (such as meeting planning, agenda setting, and note-taking) to the complex (such as brainstorming, building reference lists and outlines, and making suggestions in an authoring environment). The print-based features of wikis allow groups to capture all their work in electronic form while the development of group-mindedness, group culture, and group cohesion capitalizes on some strengths of the secondary-oral model.

Other common uses of wikis for collaborative work include the creation and sharing of information sources (such as the easy creation of simple Web sites), case libraries (such as project "halls of fame"), and student assignment submission (with the advantage of peer ratings). This kind of collaborative work can also include global community building activities that can help "internationalize" the K-12 classroom. For example, building on the [ePALS Classroom Exchange](#) tradition, educators could arrange a real-time writing experience through wikis and have their students collaborate in a global "day in the life" project. Students from across time zones/cultures could collaborate on a wiki page for a single day—all interspersing their contributions as the day progresses. This activity would give students a chance to share similarities and differences in their daily schedules with peers in the Global Village.

Similarly, educators can use wikis to provide customized project-spaces or electronic portfolio (e-portfolio) spaces for their students. Student could use their individual wiki pages as an online building area for the project or paper on which they are working. The wiki history function could work like the track changes function in a word processor but could be accessed anywhere/anytime and could also be used for maintaining running reflections or notes as the project develops. The final project or paper could then be pulled together from the material in the project space.

Some of these uses of wikis are more traditionally "print" in nature while others more obviously allow instructors to incorporate secondary-oral features, but all of these uses and potentials of wikis build on the strengths of the print model while incorporating strengths of the secondary-oral model. These uses of wikis incorporate technologies desirable to digital natives and allow digital immigrant instructors to span the print-oral continuum to maximize teaching effectiveness.

Teaching and Learning with Wikis: Building on the Strengths of the Secondary-Oral Paradigm

While the influence of the print model in teaching remains strong, using wikis in a manner that builds on the strengths of a secondary-oral model can also be effective in this cyber age and can allow instructors to meet Culligan's challenge "to identify learning strategies that are appropriate for Digital Natives . . . [and develop] learning tools that maximize the potential of their unique cognitive approach" ([2006](#), ¶ 6). Wikis are incontestably a print-based technology, but they also encourage students to acknowledge and utilize the power of student-to-student interaction, community knowledge, and structure. Once educators accept these factors as essential to the effective use of wikis, then they are utilizing print-based wikis in a secondary-oral manner.

Common uses of wikis encourage community building among students. For example, wikis can extend the popular [Facebook](#) and [MySpace](#) to several levels since unlike these systems, wikis can contain any type or organization of displayed information, not just the pre-organized "My Profile," "My Friends," or "My Photos" categories found in Facebook, for example. They can also be used, as they are at Technologies de Formation et Apprentissage ([TECFA](#)), to generate "Hot Lists," to highlight and share common interests, and to play adventure games.

Beyond these simpler uses, wikis can build on the strengths of orality for focused discussions and for changing the individual focus of traditional instruction to a focus on collaboration. For instance, wikis can be used for forum discussions that are open to anyone interested in the subject. Unlike a weblog, wiki updates are subject-driven rather than time-driven. While a weblog is most often based on a diary metaphor in which the weblog author is the primary author who posts updates on a regular (often daily) basis, a wiki is more like a friendship based on a specific interest. For example, you might share a friendship with someone based on a common interest in stamp collecting but with whom you have no other relationship. In such a situation, the only time you or your friend need to communicate (that is, update the wiki) is when you have something specific or focused to say. The wiki thus becomes an area with a very specific information-sharing purpose rather than a daily event posting. In the classroom, the wiki might be part of any collaborative assignment in which the goal is to provide concise, useful information without extraneous or irrelevant text but that also allows for links to other pages that might be of further interest. In this example, wikis' potentials span the print-oral continuum, drawing on both paradigms to promote student engagement and support socio-collaborative learning.

Wikis can also be used to change the individual focus of traditional instruction to one of collaboration and a shared construction of knowledge (c.f. Meijas [2006](#)). For example, having students work collaboratively to write and continually edit a story (print-based functions) allows a teacher to bring up issues of ownership and authorship (both oral- and print-based functions). In this exercise, an instructor might ask questions such as: How does it feel to have the part(s) of the story you worked on changed? Who "owns" the story? How do you make changes while respecting the efforts of your co-authors? How do you justify the changes you want over the changes your co-authors want? How do you negotiate final changes and/or disputes over how the story should be changed? These questions can get students to consider pervasive issues such as conceptions of copyright (and cyber copyright), especially as ownership of creative works and ideas are challenged by new technologies. There are no easy answers to such questions, and these issues often have an emotional and subjective aspect to them that may lead to very heated discussion among students. The history function in the wiki can be used by the teacher to help mediate disputes between students and provide evidence of who contributed what and when. This particular example seamlessly incorporates traditional print paradigms into an oral application and vice versa. The structured use of wikis, the selective membership of participants, and the idea of individual accountability all make this use of wikis palatable to both digital natives and digital immigrants.

Finally, wikis can be used to help students think about how information is organized and about the progressive changes in new technologies. Unlike traditional printed texts where information is accessed sequentially and as a linear whole (that is, read cover-to-cover), information in a wiki can be structured as a web of small chunks of text that may be accessed individually or navigated and understood as part of a bigger work. Wikis' text inputting and linking functions lend themselves to creating a hypertext that is comprised of many small text modules that are linked together semantically. In the classroom a teacher might assign each student to create a wiki biography page about the current leader of a country (president, prime minister, monarch, etc.). Students would also have to link their pages to classmates' pages as appropriate. If George Bush has a meeting with Jacques Chirac, for example, the students working on the pages for those two leaders could create cross-links to their respective pages. If the meeting were significant, both students could collaboratively create a separate page for that meeting. The entire web of wiki pages would be an easy-to-access resource that could be used by others. Students would see how world leaders are individuals and at the same time part of a larger entity. The teacher could then have a discussion about the ways knowledge is linked and information is connected, either explicitly by links or implicitly by the way people

navigate the entire wiki site. Students are being increasingly exposed to more and more information that is available on the Web as specific reusable knowledge objects linked from many different pages and/or accessed on an as-needed basis. A wiki can allow students to create such a knowledge space for themselves. Once again, this example builds on the strengths of the secondary-oral paradigm while continuing to incorporate print effectively.

Conclusion

The potential for utilization of wikis in a print/secondary-oral continuum is endless. As with any technology introduced into an educational system, their utilization in the classroom requires thoughtful and deliberate planning as well as creativity and enthusiasm in order for educators to achieve the most effective and appropriate instruction. In our discussion of uses and potentials of wikis in various ways that build on the strengths of both print and orality, we hope that we have demonstrated the strengths of wikis as an educational tool—not just for digital natives and technophiles but for all educators.

We welcome feedback from you on how you use wikis in your classroom, or if you would like to begin using wikis in your teaching, here are some excellent resources with which to get started:

- Swiki/CoWeb: <http://coweb.cc.gatech.edu/csl/9>
- WikiWiki: <http://c2.com/cgi/wiki?WikiWiki>
- Community Wiki <http://www.emacswiki.org/cw>
- Meatball Wiki <http://www.usemod.com/cgi-bin/mb.pl?MeatballWiki>
- PhpWiki: <http://phpwiki.sourceforge.net/>

For an example of how we have used a wiki to co-author an article in a wiki with all the features we've described here (including opportunities for open input and the accompanying stripping of protection), please visit us at <http://hilarys-wikispace.wikispaces.com/>.

[Editor's note: This article is available in [Spanish](#), courtesy of [Espiral, Educació i Tecnologia.](#)]

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